

### ABSTRACT

A method and system to automatically restart a permanent magnet  
turbogenerator/motor when a fatal fault is detected. The automatic restart logic includes time  
constraints and limitations on the number of iterations, and is useful regardless of whether the  
5 permanent magnet turbogenerator/motor is in a grid connect mode or a standalone mode, and  
regardless of how the fatal fault originates or is detected. Additional control logic is utilized  
to handle grid transients and over load conditions to prevent a fatal fault from occurring by  
using time constraints and an iterative process, together with a brake resistor to control DC  
bus voltage.

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